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ECONOMIC IMPACT ANALYSIS AS A TOOL  
IN RECREATION PROGRAM EVALUATION

by

R. Scott Jackson

Environmental Laboratory

DEPARTMENT OF THE ARMY

Waterways Experiment Station, Corps of Engineers  
3909 Halls Ferry Road, Vicksburg, Mississippi 39180-6199

Daniel J. Stynes, Dennis B. Propst

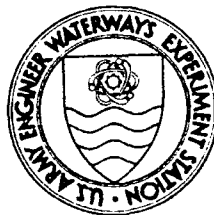
Department of Park and Recreation Resources  
Michigan State University  
East Lansing, Michigan 48824-1222

and

L. Eric Siverts

Timber/Land Management Planning Staff  
Forest Service, US Department of Agriculture  
Fort Collins, Colorado 80542

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3909 Halls Ferry Road, Vicksburg, MS 39180-6199;

Michigan State University, Department of Park and Recreation Resources,

East Lansing, MI 48824-1222;

USDA Forest Service, Timber/Land Management Planning Staff,

Fort Collins, CO 80542

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# Preface

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The work reported herein was conducted as part of the Natural Resources Technical Support (NRTS) Program. The NRTS Program is sponsored by the Headquarters, US Army Corps of Engineers (HQUSACE), and is assigned to the US Army Engineer Waterways Experiment Station (WES) under the purview of the Environmental Laboratory (EL). Funding was provided under Department of the Army Appropriation No. 96X3123, Operations and Maintenance. The NRTS Program is managed under the Environmental Resources Research and Assistance Programs (ERRAP), Mr. J. L. Decell, Manager. Dr. A. J. Anderson was Assistant Manager, ERRAP, for NRTS. Technical Monitor during this study was Ms. Judy Rice, HQUSACE.

The report was prepared by Mr. R. Scott Jackson of the EL, WES; Drs. Daniel J. Stynes and Dennis B. Propst of the Department of Park and Recreation Resources, Michigan State University; and Dr. L. Eric Siverts of the USDA Forest Service, Timber/Land Management Planning Staff.

The work was performed under the direct supervision of Mr. H. Roger Hamilton, Chief, Resource Analysis Group (RAG), and under the general supervision of Dr. Conrad J. Kirby, Chief, Environmental Resources Division, and Dr. John Harrison, Director, EL.

Mses. M. Kathleen Perales and Tere DeMoss of the RAG provided technical support in the production of the report. Technical reviewers were Dr. A. J. Anderson, EL, and Mr. John Titre, RAG.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander and Deputy Director was COL Leonard G. Hassell, EN.

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# 1 Introduction

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## Background

Increased emphasis has recently been placed on the participation of non-Federal sectors in providing recreation opportunities at Corps of Engineers water resource development projects. This initiative requires consideration of values important to public and private recreation program partners at the state and local levels. While over 40 percent of recreation areas on Corps projects are managed by non-Federal groups, the agency continues to seek increased participation by non-Federal partners to accommodate increased demand for recreation resources. Many regions of the United States depend, to varying degrees, on recreational expenditures as an important source of economic activity (Alward 1986). Local leaders have therefore placed an increased importance on public recreation opportunities as an essential ingredient in maintaining economic development through economic activity stimulated by visitor spending.

The purpose of this paper is to describe and demonstrate a procedure for determining the economic effects of Corps of Engineers recreation programs for use as a basis for dialogue with public and private non-Federal interests.

The Corps of Engineers has traditionally evaluated planned recreation development in terms of direct benefits to the visitor as defined in the National Economic Development Account of the Water Resources Council's Principles and Guidelines (US Water Resources Council 1983). Net benefits included in this type of analysis are defined as the total amount an individual is willing to pay to engage in a recreational activity minus the cost incurred by the visitor to participate in that activity. The unit day, travel cost, and contingent valuation are accepted methods for measuring user benefits.

Each method is appropriate for specific applications depending on the level of accuracy needed, availability of data, and planning questions being addressed (Walsh 1986). However, these procedures ignore the impacts to local and regional economies stemming from expenditures made by recreation visitors. These expenditures are important to non-Federal



interests when evaluating their potential "return" on investment in recreation programs.

## Economic Impact Analysis

The economic effects of recreation use associated with Corps projects can be viewed as the income and employment businesses derive as a direct or indirect result of spending by visitors to Corps projects. *Direct* effects include income and employment resulting from direct spending by visitors on goods and services required to engage in recreation activities, for instance, the retail purchase of a boat. To meet the increased demand for boats resulting from such sales, boating manufacturers will purchase materials and labor; shipping companies will purchase labor, trucks, gasoline, and other supplies; and boat dealers will purchase labor and supplies in support of their retail sales activities. The income and employment resulting from these secondary purchases are the *indirect* effects of the retail purchase of boats. The income of employees directly and indirectly supporting the sale of boats increases as a result of each boat sold. In turn, this employee income is used to purchase goods and services, and the resulting increased economic activity from employee income is the *induced* effect of the purchase of a boat.

Using this example, the sum of direct, indirect, and induced effects fully describes the economic effect of the purchase of a boat. Economic input-output (I-O) models are commonly used to predict the total level of regional economic activity that would result from a change in direct spending.

Input-output analysis can assist decision-making by providing insights to the ways in which various programs affect regional economies. By tracing spending effects throughout an economy, the extent to which various economic sectors are affected can be determined. When integrating a program or project into an economy, it is important to determine who will and will not benefit from it. Using I-O analysis, a decision-maker is able to predict the effects of various changes in policy or agency expenditures on local economies. This gives the decision-maker the ability to evaluate the potential economic effects of policy alternatives and communicate the potential impacts to local interests.

To accurately assess the economic effects of recreation policy alternatives, it is also necessary to determine how recreation use patterns and resulting visitor spending would change from current conditions in response to the policy alternative. Recreation demand models are commonly used to translate changes in recreation development, resources, and policies into changes in the amount, composition, and distribution of recreation use required in the I-O analysis process. Figure 1 illustrates the process and associated tasks for assessing the economic effects of recreation policy alternatives.

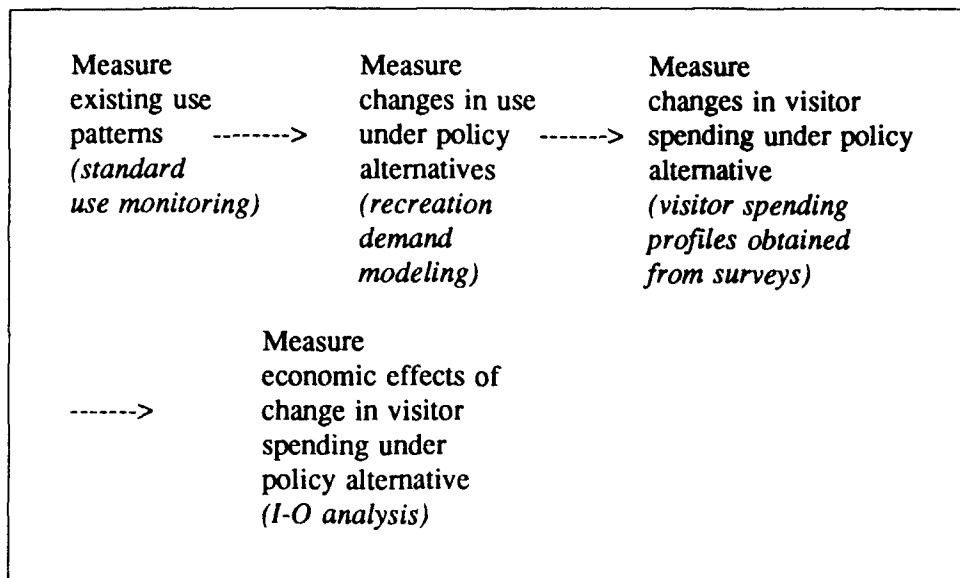


Figure 1. Process for assessing economic effects of recreation policy alternatives

## **2 Measuring Economic Effects of Lake Shelbyville Recreation Program**

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The process of assessing the economic effects of recreation use will be illustrated through an application at Lake Shelbyville, Illinois. The application will identify the economic effects of the existing recreation program on three regions: the two counties (Shelby and Moultrie) in which Lake Shelbyville is located, the State of Illinois, and the United States. In addition, the economic effects of the hypothetical development of a 200-unit campground will be examined.

Lake Shelbyville, an 11,000-acre (44.5 million-square meter) multipurpose reservoir in central Illinois, was constructed on the Kaskaskia River in 1970 to provide flood control, navigation, water supply, and recreation benefits. A total of 16 public recreation areas at Lake Shelbyville are operated by the Corps and the Illinois Department of Conservation. These areas provide facilities for camping, boating, swimming, hunting, and a variety of other water-related recreation activities. In addition, three commercial marinas operate on the lake. In June 1989, Eagle Creek Resort was opened to the public. The resort includes a 136-room hotel and associated meeting rooms and conference facilities.

### **Measuring Visitor Use**

The first step in assessing recreation economic effects is to measure the amount of recreation use associated with the lake. Recreation use is described in terms of user groups (i.e., day users, campers, and hotel guests) that exhibit homogeneous spending patterns. Defining use in this way facilitates accurate estimates of total visitor spending.

In 1989 approximately 1.1 million groups engaged in recreation at Lake Shelbyville. The vast majority of visitors (97.1 percent) participated in day-use activities, while 1.8 percent camped and 1.1 percent of the

visitor groups stayed at the Eagle Creek Resort hotel. (Estimates of use and visitor spending at the Eagle Creek Resort hotel were based on use statistics for June 1989 through May 1990.)

Important to the analysis of economic impacts is the origin of visitors in relation to the regions being studied. This is necessary to distinguish visitors bringing "new" dollars into the region from visitors who live within the region and are retaining money that already exists in the region. The majority of visitors to Lake Shelbyville live in proximity of the lake. Eighty percent of the visitors lived in the local region of Shelby and Moultrie Counties, 19.9 percent lived in Illinois (outside the local region), and only a small proportion (0.1 percent) originated from outside Illinois. Table 1 presents a summary of recreation use at Lake Shelbyville.

<b>Table 1</b> <b>Estimated Lake Shelbyville Recreation Use, 1989</b>				
<b>User Group<sup>1</sup></b>	<b>Local Region</b>	<b>Nonlocal Illinois</b>	<b>Outside Illinois</b>	<b>Total</b>
Day users	870,149	188,427	0	1,058,576
Campers	938	17,222	976	19,136
Eagle Creek Hotel <sup>2</sup>	606	11,133	631	12,370
Total	871,693	216,782	1,607	1,090,082
<sup>1</sup> All use statistics are reported in party trips.				
<sup>2</sup> Eagle Creek use was reported for June 1989 through May 1990.				

## Measuring Visitor Spending

A key step in assessing economic impacts is the development of visitor expenditure profiles. An expenditure profile is a series of mean expenditure rates, derived from visitor surveys, for individual goods and services purchased either during a recreation trip or for use on a recreation trip.

Visitor spending can be divided into two broad categories. The first category includes goods and services purchased and consumed during a single trip. These expenses are known as trip expenses. The second category includes durable goods, such as boats and camping equipment, that are purchased and used on many trips. Since durable goods are used over a period of time on multiple recreation trips, the total amount spent on such items must be adjusted downward to reflect usage solely at Lake Shelbyville. These adjustment procedures will be discussed later.

To develop both trip and durable goods expenditure profiles, a sample survey was conducted at Lake Shelbyville during the period 25 July

through 15 September 1989. Data collection procedures included a combination of personal, onsite interviews and mailback questionnaires. The interview locations were recreation areas within the Corps' project boundary. These sites were randomly sampled, to represent both temporal use patterns (month of the year, day of the week, time of day) and type of use (day versus overnight, boating versus nonboating). Trained interviewers conducted personal interviews with visitors as they were completing their visit to Lake Shelbyville. During the interviews, visitors provided recreation activity information, durable goods spending estimates, and trip characteristics.

To obtain trip spending information, visitors were asked to complete a questionnaire and return it by mail as soon as possible after returning to their permanent residence. A total of 290 groups were contacted in the survey. The response rate for the onsite interview was 92 percent, and for the mailback questionnaire, 57 percent. This yielded 267 onsite interviews and 165 mailback questionnaires.

A summary of trip expenditure profiles for Lake Shelbyville visitors is presented as Table 2. This table shows the means and standard errors of visitor expenditures for 10 aggregated categories of spending. Finally, Table 2 shows the proportion of spending that occurred within the local region (within 30 miles (48 km) of Lake Shelbyville) and the total trip spending. The average of local regional spending by the 165 groups was \$88.80 per trip. The standard error of this mean was \$11.77. Thus, it is appropriate to conclude, with 95-percent confidence, that the true mean lies between \$65.26 and \$112.34 per group per trip.

The largest proportion of spending occurred within the food and beverage category, where local visitors spent an average of \$27.38 per group per trip. Figure 2 displays the distribution of total trip spending by major spending category.

Improved accuracy in estimating visitor spending can be achieved by dividing visitors into groups that exhibit relatively homogeneous spending patterns. Figure 3 illustrates the differences in spending patterns between three groups of Lake Shelbyville visitors surveyed (i.e., day users, campers, hotel visitors). At \$248 per trip, hotel visitors spent six times that of the average day user. While some of the differences in spending between hotel visitors and day users can be attributed to the longer length of the hotel visitor's trip, the higher cost of hotel accommodations alone resulted in hotel visitors spending significantly more per trip than campers.

Table 3 shows the distribution of visitor spending for the three major user groups at Lake Shelbyville. Mean expenditures for disaggregated spending categories for each user group were used to represent visitor spending required in subsequent estimates of total visitor spending and input-output analysis. Spending by user groups was further divided into groups living inside and outside the local two-county region. As was previously discussed, this allowed a distinction to be made between the import

**Table 2**  
**Trip Spending per Party per Trip, Shelbyville (in 1989 dollars)**

Description of Spending Category	Mean	Standard Error	Percent of In-Region	Percent of Total
<b>Totals by Region of Spending</b>				
Total within 30 miles	88.80	11.77		80
Total outside 30 miles	21.56	4.36		20
Grand total	110.36	12.98		100
<b>Totals by Major Spending Category (within and outside local region)</b>				
Lodging	19.59	4.47		18
Food & beverages	35.27	3.88		32
Auto & RV	22.13	5.81		20
Airline	1.23	1.20		1
Boat	16.61	2.74		15
Fish	2.43	0.64		2
Hunt	0.00	0.00		0
Entertainment	2.70	1.38		2
Miscellaneous	7.80	3.01		7
Other	2.61	0.86		2
<b>Spending by Major Category Within Local Region</b>				
Lodging	18.21	3.99	21	17
Food & beverages	27.38	3.39	31	25
Auto & RV	17.44	5.79	20	16
Airline	0.00	0.00	0	0
Boat	15.46	2.70	17	14
Fish	2.41	0.64	3	2
Hunt	0.00	0.00	0	0
Entertainment	1.45	0.82	2	1
Miscellaneous	4.30	1.41	5	4
Other	2.15	0.77	2	2

*Continued*

<b>Table 2 (Concluded)</b>				
<b>Description of Spending Category</b>	<b>Mean</b>	<b>Standard Error</b>	<b>Percent of In Region</b>	<b>Percent of Total</b>
<b>Spending by Major Category Outside Local Region</b>				
Lodging	1.38	0.84	6	1
Food & beverages	7.88	1.57	37	7
Auto & RV	4.69	0.78	22	4
Airline	1.23	1.20	6	1
Boat	1.15	0.48	5	1
Fish	0.02	0.02	0	0
Hunt	0.00	0.00	0	0
Entertainment	1.25	0.80	6	1
Miscellaneous	3.50	2.69	16	3
Other	0.46	0.40	2	0

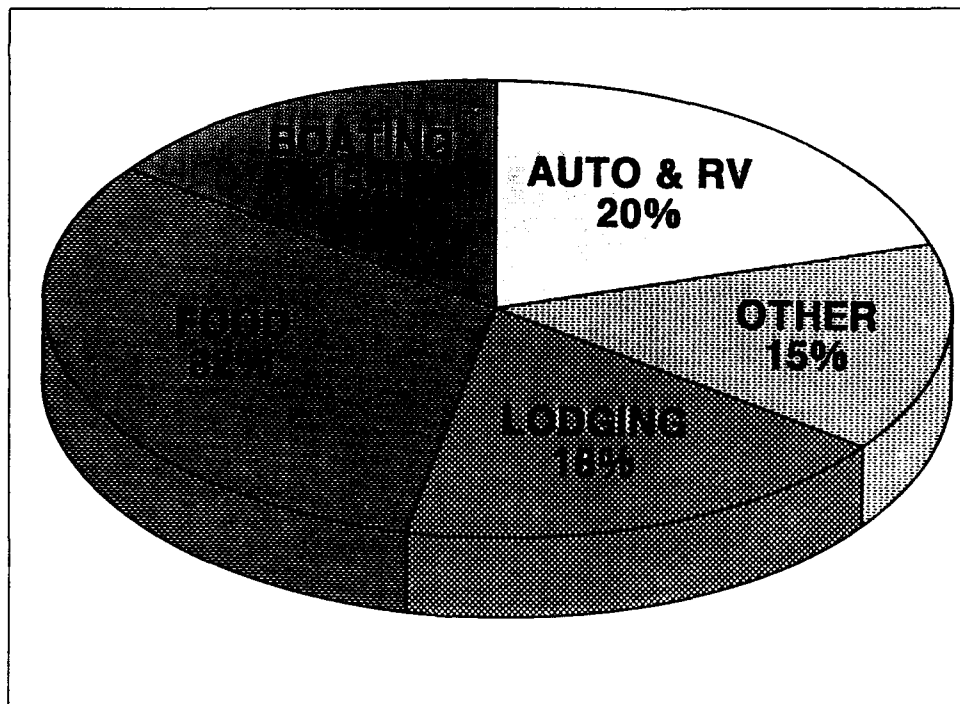


Figure 2. Trip spending by category

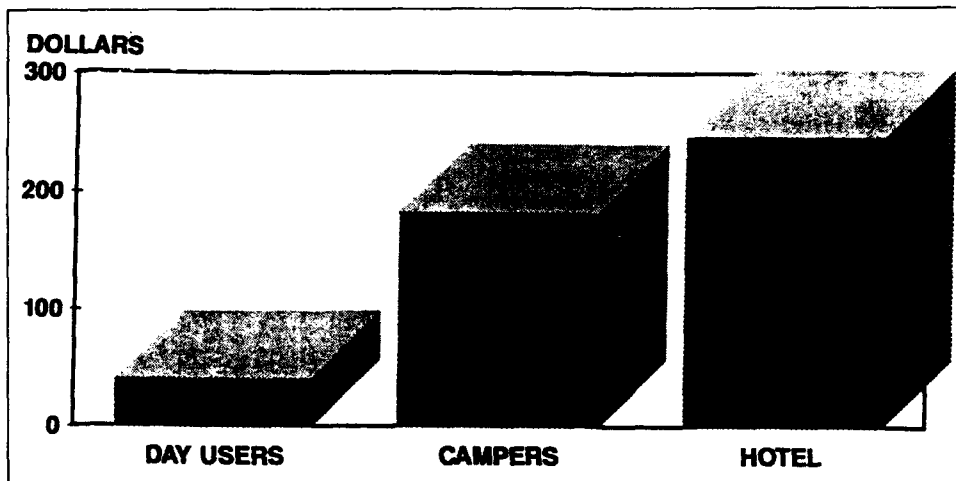


Figure 3. Trip spending profile by user group (reported on a party trip basis)

<b>Table 3</b>						
<b>Trip Spending per Party per Trip by User Group, Shelbyville</b>						
<b>(in 1989 dollars)</b>						
	Visitors from Beyond 30 Miles			Local Visitors		
	Day	Hotel	Camp	Day	Hotel	Camp
No. of cases	13	25	21	85	6	12
Percentage	8	15	13	52	4	7
<b>Average Spending per Party per Trip</b>						
<b>Totals by Region of Spending</b>						
Total within 30 miles	39.31	188.76	136.10	29.29	267.33	187.33
Total outside 30 miles	64.15	54.12	39.14	3.56	5.00	11.08
Grand total	103.46	242.88	175.24	32.86	272.33	198.42
<b>Totals by Major Spending Category (within and outside local region)</b>						
Lodging	9.23	75.00	29.38	0.54	28.00	33.83
Food & beverages	32.08	83.36	60.86	9.38	88.00	45.58
Auto & RV	8.15	29.00	35.81	8.27	25.83	97.33
Airline	0.00	7.92	0.00	0.06	0.00	0.00
Boat	11.38	30.80	21.86	8.36	86.83	6.33
Fish	0.00	2.40	4.33	1.32	18.33	1.08
Hunt	0.00	0.00	0.00	0.00	0.00	0.00

*Continued*



**Table 3. (Concluded)**

	Visitors from Beyond 30 Miles			Local Visitors		
	Day	Hotel	Camp	Day	Hotel	Camp
<b>Average Spending per Party per Trip</b>						
<b>Total by Major Spending Category (within and outside local region) (Concluded)</b>						
Entertainment	8.62	4.00	0.00	2.38	5.33	0.00
Miscellaneous	34.00	9.20	12.90	0.33	20.00	14.25
Other	0.00	1.20	10.10	2.22	0.00	0.00
<b>Spending by Major Category within Local Region</b>						
Lodging	9.23	68.64	27.19	0.27	28.00	33.83
Food & beverages	21.69	62.68	39.95	8.41	84.67	38.92
Auto & RV	2.08	16.08	24.76	7.40	24.17	93.92
Airline	0.00	0.00	0.00	0.00	0.00	0.00
Boat	6.15	29.16	21.86	7.86	86.83	5.33
Fish	0.00	2.28	4.33	1.32	18.33	1.08
Hunt	0.00	0.00	0.00	0.00	0.00	0.00
Entertainment	0.00	2.80	0.00	1.61	5.33	0.00
Miscellaneous	0.15	5.92	11.00	0.33	20.00	14.25
Other	0.00	1.20	7.00	2.09	0.00	0.00
<b>Spending by Major Category Outside Local Region</b>						
Lodging	0.00	6.36	2.19	0.27	0.00	0.00
Food & beverages	10.38	20.68	20.90	0.96	3.33	6.67
Auto & RV	6.08	12.92	11.05	0.87	1.67	3.42
Airline	0.00	7.92	0.00	0.06	0.00	0.00
Boat	5.23	1.64	0.00	0.51	0.00	1.00
Fish	0.00	0.12	0.00	0.00	0.00	0.00
Hunt	0.00	0.00	0.00	0.00	0.00	0.00
Entertainment	8.62	1.20	0.00	0.76	0.00	0.00
Miscellaneous	33.85	3.28	1.90	0.00	0.00	0.00
Other	0.00	0.00	3.10	0.13	0.00	0.00

of new dollars into the region and the retention of money already in the region.

Total visitor trip spending was calculated by multiplying visitor use estimates for day users, campers, and hotel visitors from Table 1 by their corresponding expenditure profile presented in Table 3. Table 4 presents these products, or total visitor trip spending for each user group by visitor origin and spending location. As the table shows, a total of over \$54 million was spent by Lake Shelbyville visitors on trip expenses. The majority of trip spending, \$32.9 million, was made in the local region by Illinois day users (\$25.5 million within and \$7.4 million outside the local region). Imported spending into the local region by visitors living outside the region was an important share of visitor spending, constituting \$12.1 million (\$11.85 million nonlocal Illinois plus \$250,000 outside Illinois) or 22 percent of all spending. Figure 4 illustrates how local spending is distributed between local and nonlocal visitors. Figure 5 presents the distribution of spending among user groups.

<b>Table 4 Total 1989 Trip Spending by Lake Shelbyville Visitors (in dollars)</b>				
<b>Origin of Visitor</b>	<b>Location of Spending</b>			
	<b>Local Region</b>	<b>Nonlocal Illinois</b>	<b>Outside Illinois</b>	<b>Total</b>
<b>Local Region</b>				
Day users	25,486,664	3,097,730	0	28,584,394
Campers	175,715	10,393	0	186,108
Hotel	162,001	3,030	0	165,031
Subtotal	25,824,380	3,111,153	0	28,935,533
<b>Nonlocal Illinois</b>				
Day users	7,407,065	12,087,592	0	19,494,657
Campers	2,343,914	674,069	0	3,017,983
Hotel	2,101,465	602,517	0	2,703,982
Subtotal	11,852,444	13,364,178	0	25,216,622
<b>Outside Illinois</b>				
Day users	0	0	0	0
Campers	132,833	19,100 <sup>1</sup>	19,100 <sup>1</sup>	171,033
Hotel	119,107	17,074 <sup>1</sup>	17,074 <sup>1</sup>	153,255
Subtotal	251,940	36,174	36,174	324,288
<b>Total</b>	<b>37,928,764</b>	<b>16,511,505</b>	<b>36,174</b>	<b>54,476,443</b>

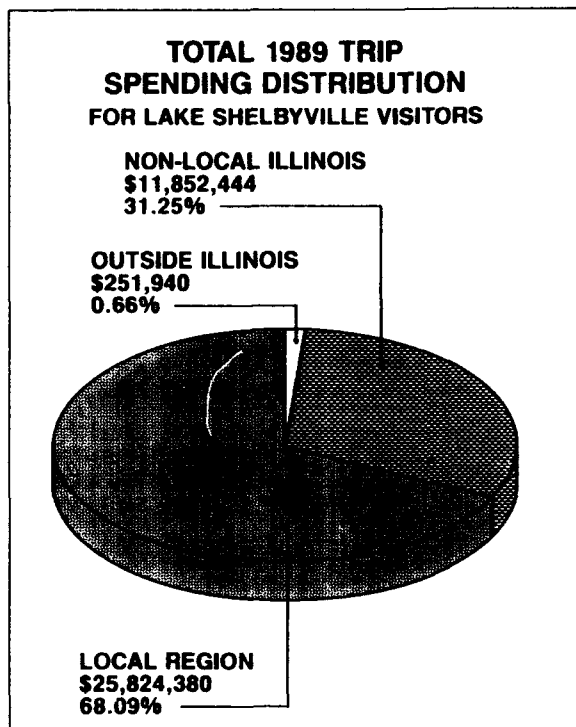


Figure 4. Distribution of local spending by visitor origin

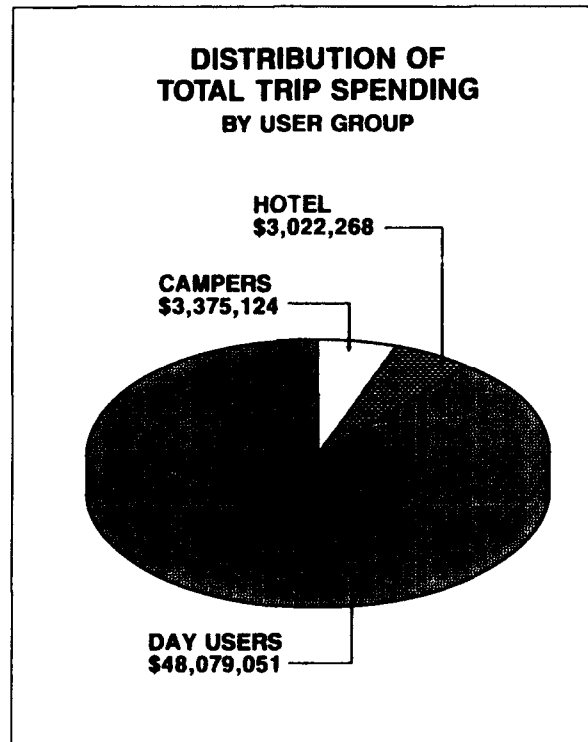


Figure 5. Total trip spending by user group

Table 5 presents a summary of durable goods spending as reported in the onsite survey. The 267 survey respondents reported purchases of 668 items that cost approximately \$1.9 million. Boats and related equipment purchases accounted for most of the spending. Camping equipment (including trailers and motorhomes) was the second highest spending category. The average visitor reported spending \$7,244 for all durable goods used on that trip, of which \$720 was spent in the last year.

While trip spending was reported by respondents on a per-trip basis, durable goods spending had to be adjusted to a per-trip basis because durable goods are used on multiple trips. Durable goods spending was reported by visitors responding to the onsite interview for items brought on that trip. Durable goods spending was adjusted to a per-trip basis for each respondent by dividing the total cost of durable goods purchased within the last year by the number of trips made within the previous year. Purchases made within the last year were included only to allow direct application of durable goods spending to annual estimates of use. Average durable goods spending for all users was \$14.75 per trip in the local region and \$110.16 per trip outside the local region. The county in which the item was purchased was used to allocate durable goods spending to the appropriate regions (within Shelby/Moultrie counties (the local region), within the rest of Illinois, or outside Illinois).

Purchases of boating, camping, and other equipment for use at lakes such as Lake Shelbyville are substantial. However, there is no simple way of attributing these purchases to a single lake because these items may be used at many sites. One rationale for allocating durable goods spending to Lake Shelbyville would be to determine the proportion of use that a given durable item receives at Lake Shelbyville versus other sites. This could be quite high for boating and fishing equipment bought by locals, but is probably lower for purchases made by nonlocals. In the absence of credible estimates of total annual use of durable items purchased, it is necessary to select a percentage that would approximate the proportion of total durable goods use that occurs at Lake Shelbyville versus other sites. We recommend attributing 25 percent of all durable goods spending to Lake Shelbyville.

Use of the 25-percent allocation resulted in average durable goods spending for all users of \$3.68 per trip in the local region and \$27.54 per trip outside the local region. The application of these per-trip durable goods spending estimates to total 1989 use at Lake Shelbyville resulted in an estimate of \$4.02 million in durable goods spending in the local region, \$27 million in Illinois (outside the local region), and \$3 million outside Illinois.

Figure 6 displays the distribution of durable goods and trip spending by location in which the spending occurred. Most trip spending occurred in the local region, while the majority of durable goods spending occurred outside the local region.

**Table 5**  
**Spending on Durable Goods, Lake Shelbyville (in 1989 dollars) (n = 267)**

Durable Item	Number Reported	Percent of Items	Average Cost, All Items	Total Spent	
				All Items	Purchases Last Year
Motor boat	25	3.7	12,092	302,292	71,500
Nonmotor boat	2	0.3	468	935	0
Rubber boat	5	0.7	63	313	0
Jet ski	1	0.1	3,700	3,700	0
Outboard motors	11	1.6	2,155	23,705	950
Trailer	10	1.5	688	6,875	0
Water skis	34	5.1	365	12,421	170
Boat accessories	41	6.1	1,010	41,415	2,650
Combination boat/trail/motor	105	15.7	8,610	904,060	111,300
Fishing rods	103	15.4	421	43,350	1,075
Nets	2	0.3	30	60	0
Depth finder	51	7.6	348	17,737	320
Vests	68	10.2	173	11,792	190
Waders	3	0.4	28	83	0
Trolling motor	29	4.3	380	11,020	1,170
Guns	1	0.1	200	200	0
Tents, bags	27	4.0	507	13,695	0
Motorhome	14	2.1	19,146	268,046	0
Travel trailer	32	4.8	5,703	182,480	1,000
Pickup camper	4	0.6	4,700	18,800	0
Camping vehicle accessories	13	1.9	2,133	27,723	60
Trail bikes	1	0.1	0	0	0
Bikes	19	2.8	263	4,999	300
Other recreational equipment	67	10.0	575	38,507	1,563
Total	668	100.0			
Total				1,934,209	192,248
Average Visitor Expenditure				7,244	720
Percent of Total				100	9.9



Figure 6. Distribution of trip and durable goods spending by location of spending

## Assessing Economic Effects

The translation of visitor spending into economic effects in terms of income and employment was accomplished through the use of an input-output model. The model is an accounting system showing economic transactions between local businesses, households, and governments, as well as transactions between public and private entities located elsewhere. Although an I-O model provides only a static view of economic conditions, it is an effective device for characterizing and analyzing complex local, regional, and national economies. The I-O models are constructed for specific geographic regions in order to capture the specific economic sectors and linkages that exist in the region.

IMPLAN, an I-O model developed by the USDA Forest Service, was selected for use in this application based on two major factors. First, it provides more detailed information than most other I-O models for recreation-related economic sectors. An economic sector is a group of industries that produce similar goods and services (e.g., retail trade sector). Second, it is a national model that facilitates standardized application throughout the United States and allows both local and national effects to be measured.

Three distinct I-O models were developed using IMPLAN, each corresponding to a distinct region of interest. The *Local* model consists of Shelby and Moultrie Counties. These two counties roughly coincide with a 30-mile circle around Lake Shelbyville. This model includes 124 of the 528 sectors that exist in IMPLAN. The *State* model includes all of Illinois. The Illinois model includes 494 sectors. The *National* model includes the entire continental United States and includes all 528 economic sectors.

Each model describes the structure of the relevant regional economy. Moving from the *Local* to the *State* and then to the *National* model, more industrial sectors are represented, and there are fewer leakages of dollars outside the region for imports.

A final demand vector, which consists of visitor purchases to the 528 IMPLAN sectors, is required as input into the model. In the case of recreation applications, this vector is developed from estimates of the amount of spending by visitors to the specified area as described in the previously discussed visitor spending profiles. For trip spending, six profiles were used—day users, campers, and hotel visitors living within the local region and living outside the local region. For durable goods spending, two profiles were used, visitors living within the local region and visitors outside the local region. The final demand vectors also account for where the spending occurred, i.e., within or outside the local region.

Spending of visitors within 36 trip expense categories and 24 types of durable goods was allocated into the 528 IMPLAN sectors to produce sector-specific final demand vectors. As part of the allocation process, retail, wholesale, and transportation margins were estimated and allocated to the appropriate IMPLAN sector. A margin is the difference between the cost and selling price of a good or service.

For any final demand vector, IMPLAN produces estimates of the effects on employment and income, along with other measures of economic activity. The estimates reported include direct, indirect, and induced effects. IMPLAN'S estimates of employment and income have specific interpretations that are important. Employment is reported in terms of numbers of jobs, which include a mix of both permanent full-time, part-time, and temporary employees. Income estimates reported from the I-O model are referred to as factor income by place of production. Two distinctions are important here. First, factor income means payments to factors of production (i.e., labor and capital). For the case of labor, wages paid in the production process represent a part of total personal income, the remainder coming from several sources including investment dividends and government transfer payments. Second, income is reported by place of production, not by place of residence. This means that, for areas where large numbers of employees live outside the study area and commute to work, the model will overstate the effects. IMPLAN uses 1982 economic data to estimate economic effects; therefore, all income estimates are reported in 1982 dollars. The final demand vectors were converted to 1982 dollars to provide consistency with IMPLAN.

For the local and Illinois regional models, two distinct types of analyses were conducted. *Impact* analysis is the term used to evaluate the effects of "outside" dollars being imported into the region from visitors who live outside the region. The term *significance* is used to indicate the effects of spending within the region from both resident and nonresident visitors.

*Impact* analysis is the most common use of I-O models. For the *Local* model (Shelby and Moultrie Counties), the *impacts* of Lake Shelbyville include only the spending within the two counties by visitors from outside the two counties. This spending represents the inflow of "new" dollars to this local economy. The rationale for this approach is that if Lake Shelbyville were not available for recreation, these dollars from nonresidents would not be flowing into the region; rather, a high proportion of spending by local residents would be transferred to other sectors of the local economy.

The *significance* analysis for the *Local* model includes all spending within the region associated with all visits to Lake Shelbyville. As a large percentage of the use of Lake Shelbyville is from nearby residents, much of this spending is not new dollars to the region. Local resident spending can be important in identifying which local economic sectors benefit from visits to the lake. Also, to the extent that local residents would otherwise go outside the region for recreation if the lake were not available, local spending by locals represents a potential leakage of spending that the lake captures.

Combining the *impact* and *significance* analyses with the three regions, five scenarios are generated as follows:

*Local significance:* The effects on Shelby and Moultrie Counties of all spending within the region by Lake Shelbyville visitors. Both local and nonlocal visitors are included.

*Local impact:* The effects on Shelby and Moultrie Counties of the spending of visitors from outside the region. In this analysis, local visitors are not included, nor is any spending associated with the visit that occurs outside the region.

*State significance:* The effects of any spending within the State of Illinois by all 1989 visitors to Lake Shelbyville.

*State impact:* The effects on Illinois of the spending of out-of-state visitors to Lake Shelbyville. This analysis includes only visitors from outside Illinois, and only their spending within the state.

*National significance:* The effects on the US economy of all spending associated with trips to Lake Shelbyville in 1989.

These scenarios produce differing results due to differences in final demand (total visitor spending) and in the economic structures at local, state, and national levels.

The results of the five scenarios are summarized in Table 6. This table outlines the total economic effects, for all use of Lake Shelbyville in 1989, under each of the five scenarios. The effects on employment and income are reported for the three user groups and for all users combined.



**Table 6**  
**Shelbyville Impact Analysis—Total Impacts of Present Use—Trip Spending**  
**and Durable Goods Purchases**

	Local Significance	Local Impact	Illinois Significance	Illinois Impact	National Significance
<b>Trip Spending</b>					
Employment (number of jobs)					
Campers	65	62	77	4	124
Day users	714	286	1,037	0	1,673
Hotel use	81	78	84	4	160
All	860	427	1,199	8	1,956
Total Income (millions of 1982 dollars)					
Campers	0.96	0.90	1.76	0.09	3.77
Day users	10.81	3.64	23.61	0.00	50.92
Hotel use	1.07	0.99	1.76	0.09	4.47
All	12.85	5.53	27.12	0.18	59.16
<b>Durable Goods Purchases</b>					
Employment <sup>1</sup> (number of jobs)					
Campers	1	0	77	4	164
Day users	34	6	365	0	588
Hotel use	3	3	35	2	72
All	38	9	477	6	824
Total Income <sup>1</sup> (millions of 1982 dollars)					
Campers	0.01	0.01	1.63	0.08	5.03
Day users	0.56	0.10	8.55	0.00	18.66
Hotel use	0.04	0.04	0.81	0.05	2.26
All	0.61	0.15	10.99	0.13	25.95
<b>Number of Trips (000's)</b>					
Campers	19.14	18.20	19.14	0.98	19.14
Day users	1,058.58	188.43	1,058.58	0.00	1,058.58
Hotel use	12.37	11.76	12.37	0.63	12.37
All	1,090.08	218.39	1,090.08	1.61	1,090.08
<sup>1</sup> This is a 25-percent allocation of the total effects of durable goods spending based on the assumption that 25 percent of the use of durable goods purchased occurred at Lake Shelbyville.					

The effects of trip spending are reported separately from those for durable goods.

When examining employment effects associated with trip spending under the *significance* scenarios, notice that the effects get larger as the size of the region increases. This is because more visitor spending is being included in the final demand vector, and less spending leaks out of the region in successive rounds of spending (indirect and induced effects). Spending on trips to Lake Shelbyville in 1989 generated 860 jobs within the two-county area, 1,199 within Illinois, and 1,956 jobs nationally.

The employment effects of "new" dollars into the region (*impact scenarios*) resulted in 427 jobs in the local region from trips by visitors originating from outside the region and 8 jobs in the State of Illinois resulting from trips by visitors from outside the state. This finding illustrates that the lake primarily serves a state market with the primary regional effect being a flow of dollars (and jobs) to the Shelby/Moultrie Counties from the rest of Illinois.

Similar results were obtained for the effects on income. Focusing on the local region, outside visitors to Lake Shelbyville generated \$5.5 million in income locally. Figure 7 shows the proportion of total income and employment in the local region attributable to trip spending by Lake Shelbyville visitors. Lake Shelbyville trip spending accounted for 9.5 percent of total local employment and 5.2 percent of total local income. Imported spending into the local region by Lake Shelbyville visitors living outside the region was an important component of total spending, accounting for 4.7 percent of local employment and 2.2 percent of local income.

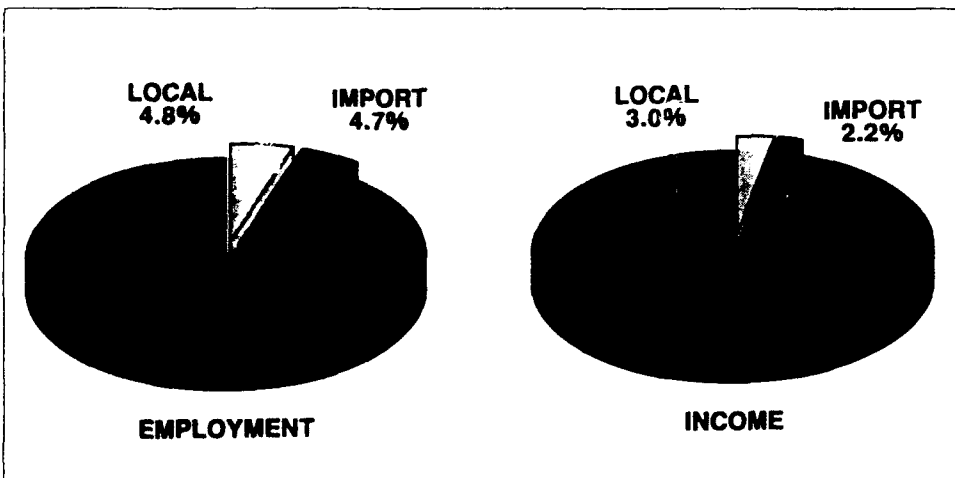


Figure 7. Proportion of regional income and employment from trip spending ("Other" = regional economic activity not associated with Lake Shelbyville trip spending)

Table 6 shows the impacts of durable goods purchases, bought within the last year and used at Lake Shelbyville under the previously described 25-percent durable goods spending allocation. The employment effects of durable goods purchases under the *significance* scenario resulted in 38 jobs in the local region, 477 in Illinois, and 824 nationally. Most major durable items such as boats and recreational vehicles are manufactured outside the local region and, in many cases, outside Illinois. Consequently, there is a significant increase in employment effects in the Illinois and national regions. Under the *impact* scenario, nine jobs are produced in the Shelby-Moultrie Counties, and only six jobs in Illinois result from durable goods purchased in Illinois by out-of-state visitors to Shelbyville.

## Evaluation of a Management Alternative

The preceding discussion presented the economic effects of recreation use under existing conditions in 1989. However, input-output analysis is an effective tool to evaluate the economic implications of management and policy decisions that affect recreation behavior. To illustrate this type of application we will assume that a 200-unit campground is being considered for construction to meet a demonstrated demand for camping facilities. Assuming such an expansion would generate occupancy rates like those at present campgrounds, it is estimated that the proposed facility would generate an additional 3,334 trips by camping groups to Lake Shelbyville. If it is further assumed that these trips would be distributed from different origins like the present campgrounds and that the campers would spend at rates similar to the two camping groups surveyed (local and nonlocal campers), a new final demand vector can be created to estimate the economic effects of the five scenarios.

For instance, from Table 1 we see that about 95 percent of all campers at Lake Shelbyville came from outside the local region (17,222 nonlocal Illinois plus 976 outside Illinois campers divided by 19,136 total campers). When the 95 percent is applied to the estimated 3,334 camping trips in the new campground, this results in about 3,170 camping trips. From Table 3 we find that nonlocal campers spent \$136.10 per trip in the local region. When the \$136.10 per trip spending rate is applied to the 3,170 trips, this results in approximately \$430,000 in trip spending under the local *impact* scenario in Table 7. The economic effects of the 200-unit campground are shown in Table 7.

Under the *significance* scenario, 11 new local jobs are created, 13 in Illinois, and 22 nationally from trip spending. Because campers come from outside the local region, the local *impact* is also 11 jobs. Less than one job is created as a result of out-of-state camper spending.

Applying the 25-percent share of durable goods spending, the new campground would have only a small local employment effect; however,

**Table 7**  
**Economic Effects of a 200-Unit Campground**

	Local Significance	Local Impact	Illinois Significance	Illinois Impact	National Significance
Trip spending (\$MM, 1982)	0.46	0.43	0.56	0.03	0.56
Income (\$MM, 1982)	0.17	0.16	0.31	0.02	0.66
Employment (Jobs)	11.37	10.87	13.40	0.68	21.57
Durable goods spending	0.02	0.01	2.56	0.13	2.56
Income (\$MM, 1982)	0.00	0.00	1.14	0.06	3.50
Employment (Jobs)	0.30	0.19	53.68	2.69	114.46
Number of trips (000's)	3.33	3.17	3.33	0.17	3.33

about 13 jobs would be created in Illinois and 28 nationally under the *significance* scenario.

This application demonstrates that it is possible to link economic effects to a specific management action (i.e., development of a 200-unit campground). This capability will allow managers to work with non-Federal interests to identify partnership opportunities based on the economic effects to the local area through increased business activity. Nonlocal interests will be able to make investments in public recreation in a more businesslike way by being able to compute the potential economic return on specific investment alternatives.

### 3 National Economic Effects of Corps Recreation Program

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The economic effects of the national Corps recreation program can be inferred by applying spending patterns for Lake Shelbyville campers and day users to nationwide estimates of the number of campers and day users that use Corps projects. In 1988, over 2 billion visitor hours of recreation use was reported at over 470 Corps projects. This translates into over 95 million user groups using Corps projects for recreation. Table 8 presents the national effects of 1988 recreation use at Corps projects.

<b>Table 8 National Effects of Corps Recreation Trip Spending</b>				
<b>User Group</b>	<b>Trips (000) (1988 NRMS)<sup>1</sup></b>	<b>Trip Spending (\$MM 1982)</b>	<b>Income (\$MM 1982)</b>	<b>Employment (Jobs)</b>
Day users	71,444	4,128	3,436	112,881
Campers	23,558	7,392	4,678	152,400
Total	95,002	11,520	8,114	265,281
<sup>1</sup> Natural Resource Management System (US Army Corps of Engineers 1988).				

Assuming all Corps campers and day users have the same spending patterns as Lake Shelbyville visitors, over \$11 billion was spent on non-durable goods and services associated with recreation at Corps projects. Trip spending generated over \$8.1 billion of income and over 265,000 jobs.

Travel and tourism industries are a major economic force in the United States, touching many sectors of the economy. In 1988, travel and tourism-related industries accounted for \$302 billion in receipts, resulting in 5.42 million jobs (US Travel Data Center 1989). The Corps recreation

program accounts for a significant portion of the economic activity associated with travel and tourism in the United States. Trip spending by visitors to Corps projects accounted for approximately 3.6 percent of all tourism spending and resulted in about 4.8 percent of all tourism employment.

These results do not mean that if recreation use were to no longer exist at Corps projects the associated jobs and income would be lost. A very small portion of trip spending is "new" money to the United States (only spending from foreign visitors). Most is money that would be spent in the United States regardless of whether recreation opportunities existed at Corps projects. Therefore, changes in economic conditions would be in the form of shifts in jobs and income between economic sectors or geographic locations as a direct result of shifts in recreation use patterns which stem from the change in the supply of recreation resources.

## 4 Conclusions

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Input-output analysis is an important tool to evaluate the economic implications of management and policy decisions. As non-Federal groups become more actively involved in the Corps recreation program, the Corps needs to place greater importance on and improve the capability to identify and evaluate the regional effects of policy decisions and resource allocations. The Lake Shelbyville application demonstrates a credible approach for measuring the economic effects of the current recreation program and for predicting the potential effects of a hypothetical recreation development.

The precise application of I-O analysis to recreation management issues at Corps projects requires that the recreation use be continuously and accurately monitored at all Corps projects. In addition, nationally representative visitor spending profiles are required for all major Corps project user groups. These profiles will reduce the need to perform visitor spending surveys for each future I-O application, thus improving the efficiency and reducing the cost of applying the I-O process.

The analysis demonstrated that visitor spending associated with recreation at Lake Shelbyville was an important component in the total local economy. Visitor spending accounted for over 9 percent of local employment and over 5 percent of local income. The ability to measure the economic effects of recreation use at Corps projects is an important tool in increasing non-Federal investment in the Corps recreation program. This potential regional economic development, however, should be viewed as a positive by-product of Corps projects constructed and managed to support national economic development through the provision of public benefits.

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